



# 2024 Spring Flood Outlook

*U.S. Army Corps of Engineers - St. Louis District*

*Flood Preparedness Meeting  
February 27, 2025*



**NATIONAL WEATHER SERVICE**  
OCEANIC AND ATMOSPHERIC ADMINISTRATION



• Lincoln, Illinois



# Spring Flood Outlook - BLUF



## Near normal to below normal flood risk

- Mississippi River:
  - Overall minor flooding unlikely (<50%)
  - Chester to Cape Girardeau (>50%)
- Missouri River:
  - Minor flooding unlikely (<50%)
- Illinois River:
  - Minor flooding likely at Havana and Beardstown, but below normal risk
- Local tributaries:
  - Near normal to below normal flood risk





# Spring Flood Outlook

## 2025 Spring Flood Outlook Issuance Dates

- ~~Thursday, February 13th~~
- Thursday, February 27th
- Thursday, March 13th



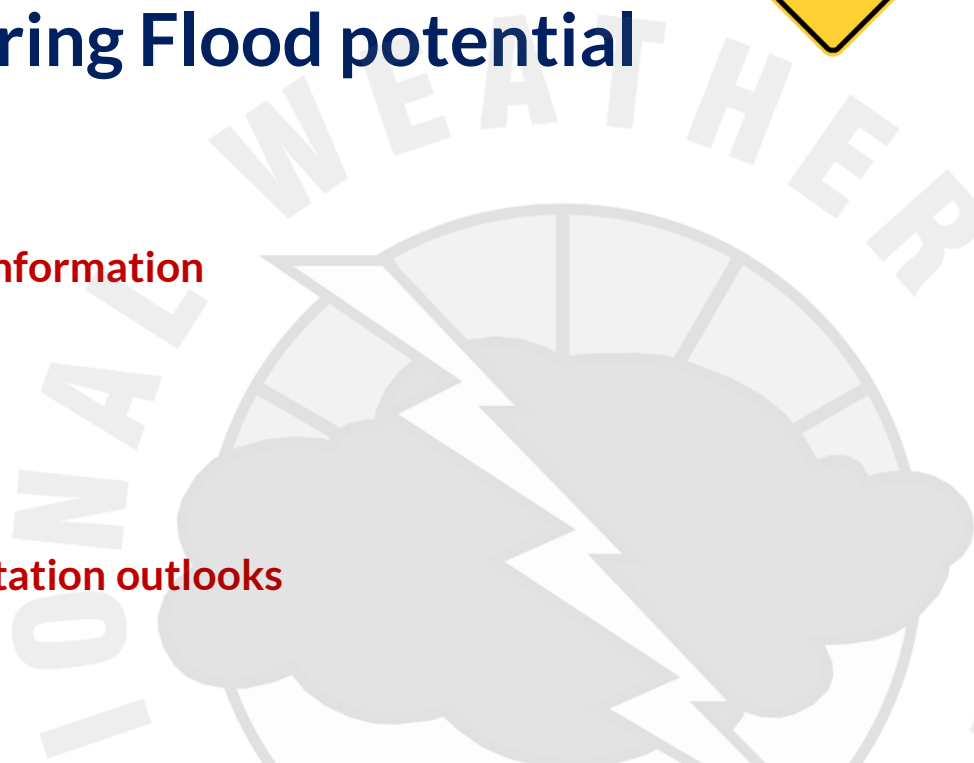


# Spring Flood Outlook



## Factors we look at for Spring Flood potential

- Recent precipitation in major river basins
- Current snow pack/snow water content information
- Current river streamflow conditions
- Soil temperature/moisture conditions
- Short / Long range temperature & precipitation outlooks



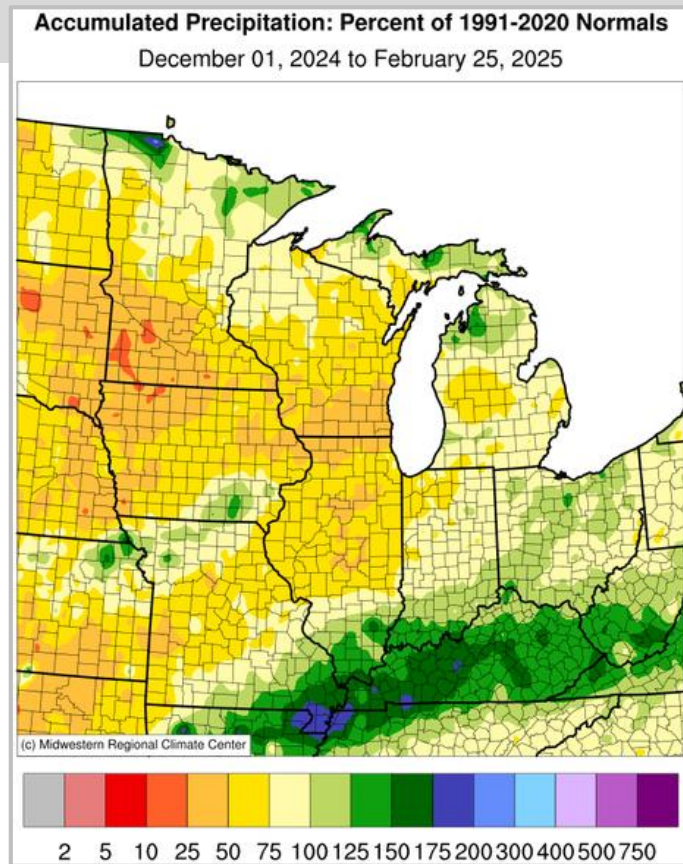
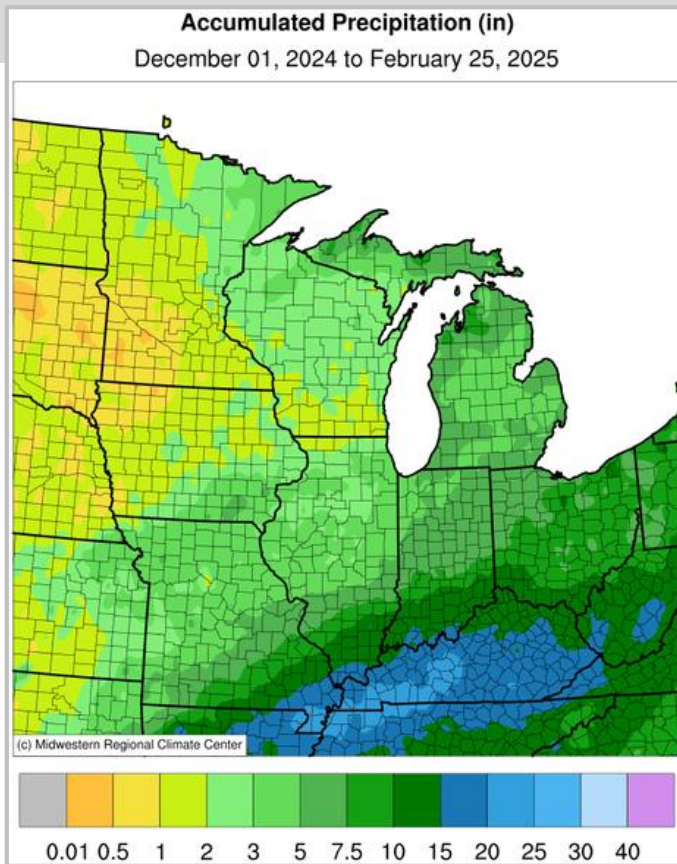


# Winter Precipitation Review





# Winter Precipitation

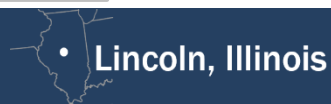


**MRCC**  
Midwestern Regional Climate Center

<https://mrcc.purdue.edu/>



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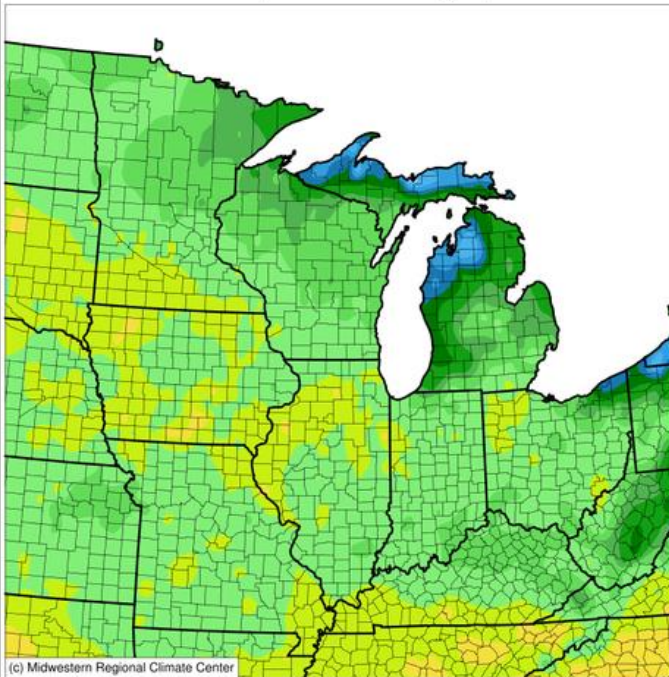




# Winter Snowfall

## Accumulated Snowfall (in)

December 01, 2024 to February 25, 2025



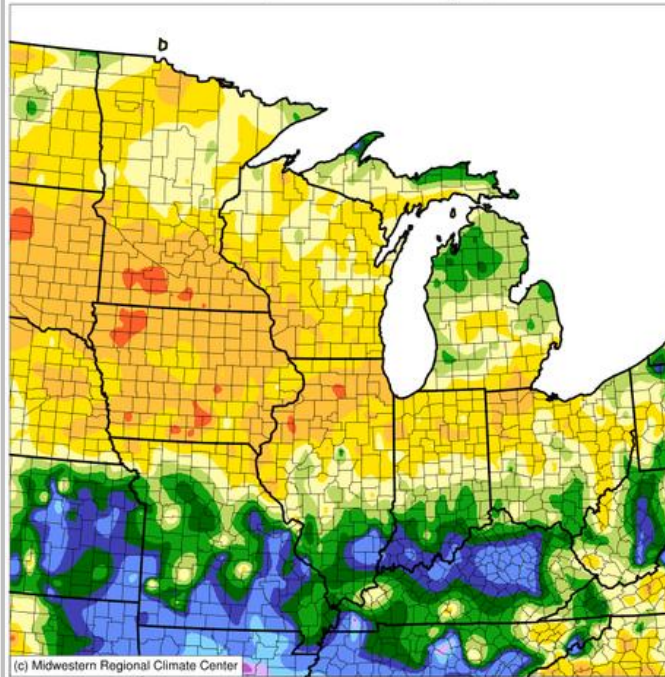
(c) Midwestern Regional Climate Center



0.01 1 5 10 20 30 40 60 80 100 125 150 175

## Accumulated Snowfall: Percent of 1991-2020 Normals

December 01, 2024 to February 25, 2025



(c) Midwestern Regional Climate Center



2 5 10 25 50 75 100 125 150 175 200 300 400 500 750

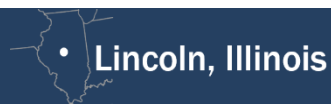


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Midwestern Regional Climate Center

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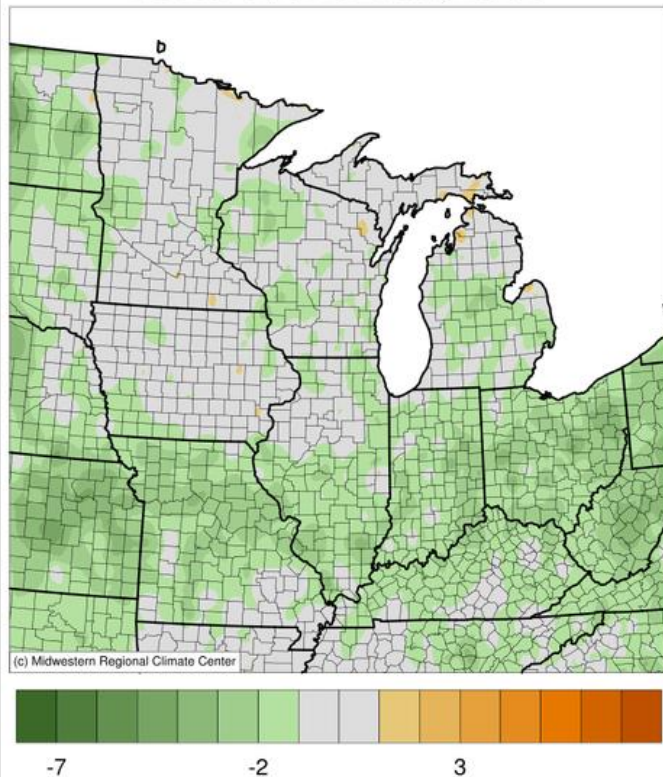
Lincoln, Illinois



# Winter Temperatures

Average Temperature (°F): Departure from 1991-2020 Normals

December 01, 2024 to February 25, 2025



<https://mrcc.purdue.edu/>



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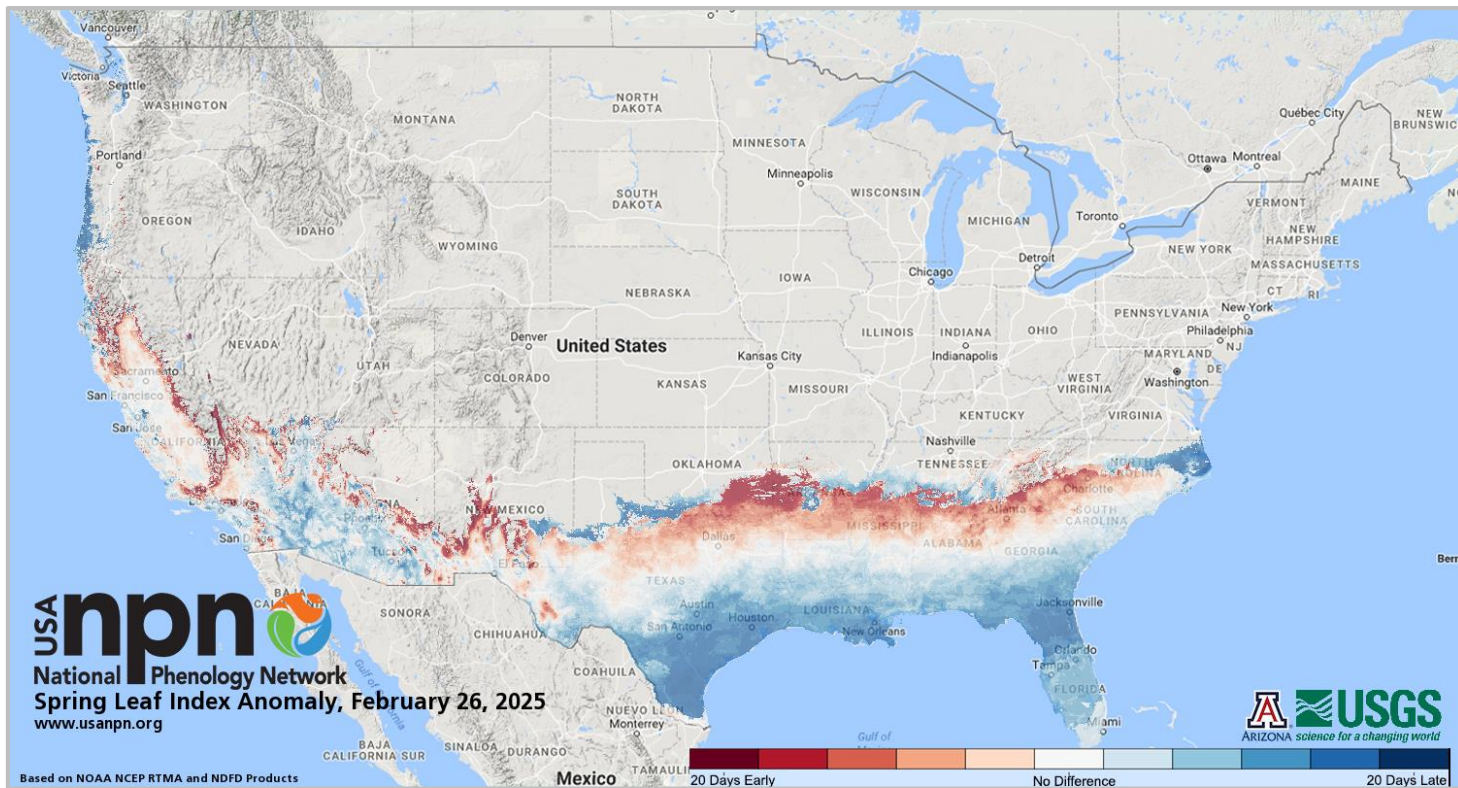


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# Early Spring Leaf Out



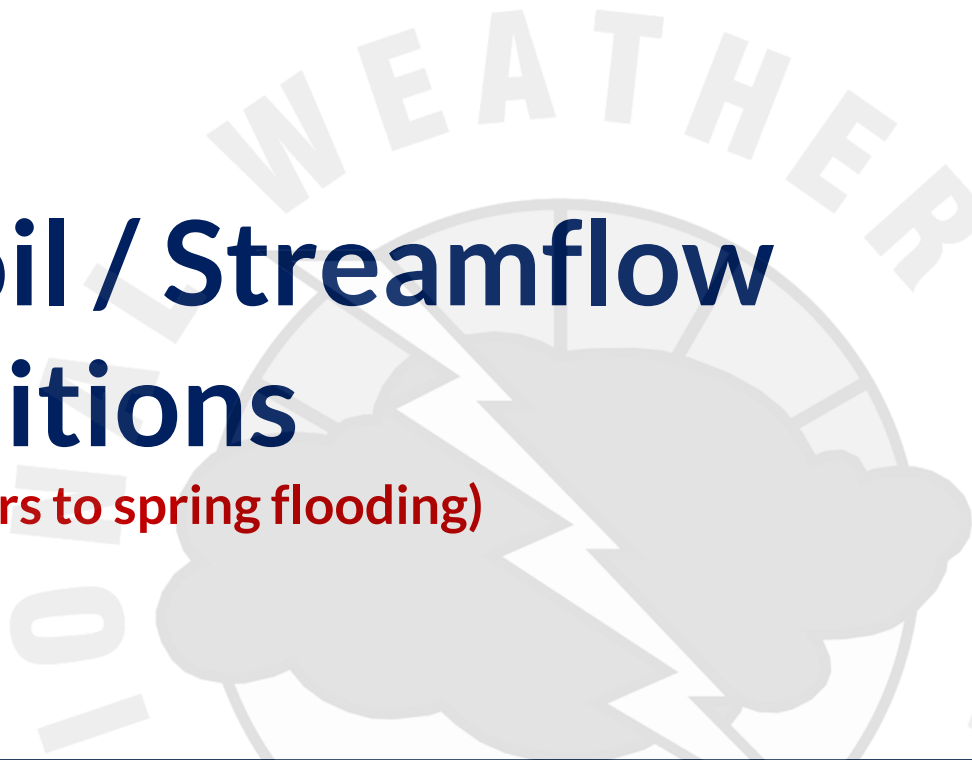
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# Snowpack / Soil / Streamflow Conditions

(Contributing factors to spring flooding)

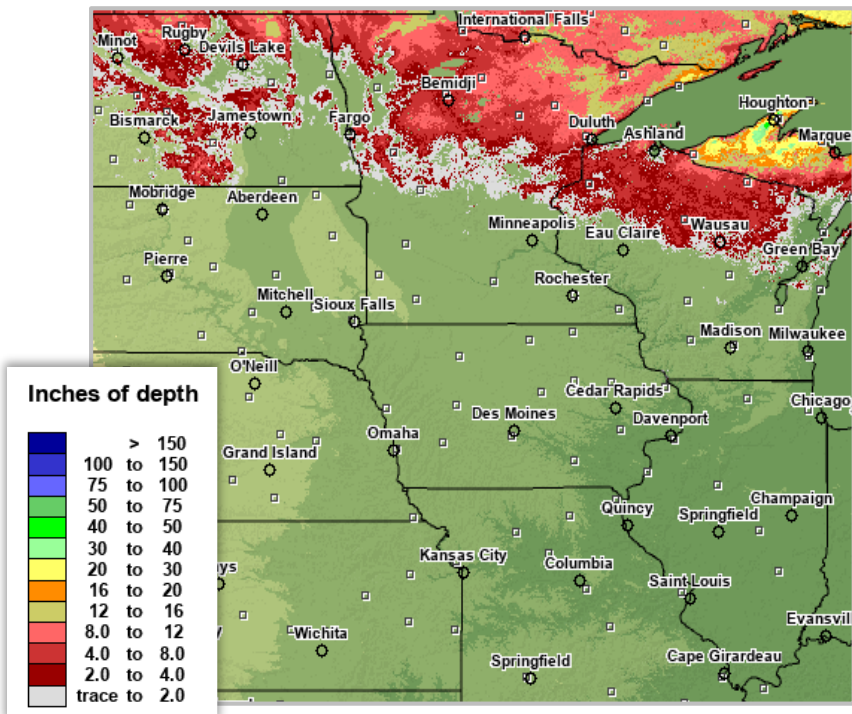




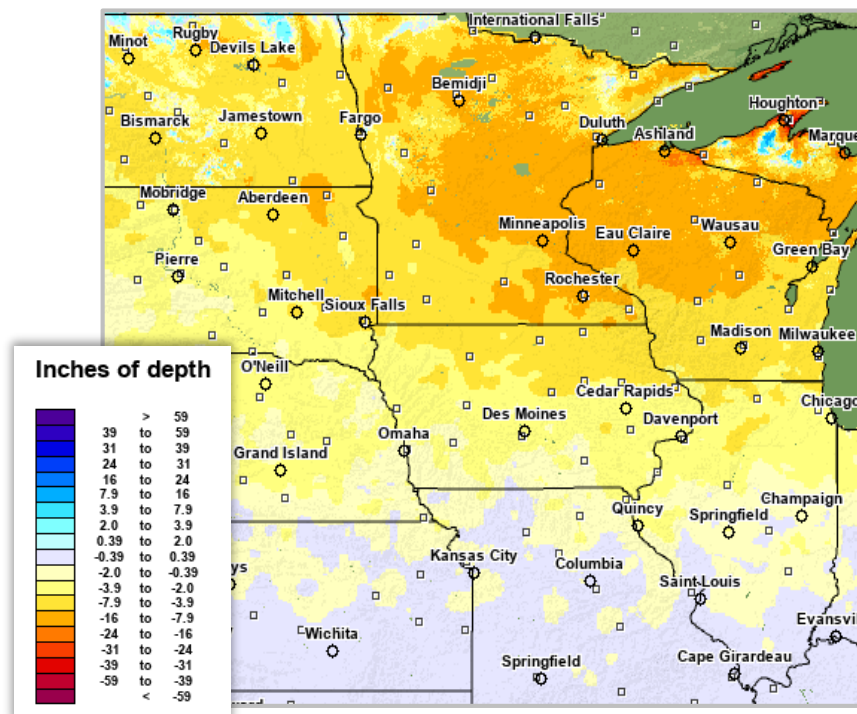
# Modeled Snow Depth

February 26, 2025

## Snow Depth



## Snow Depth - Compared to Normal



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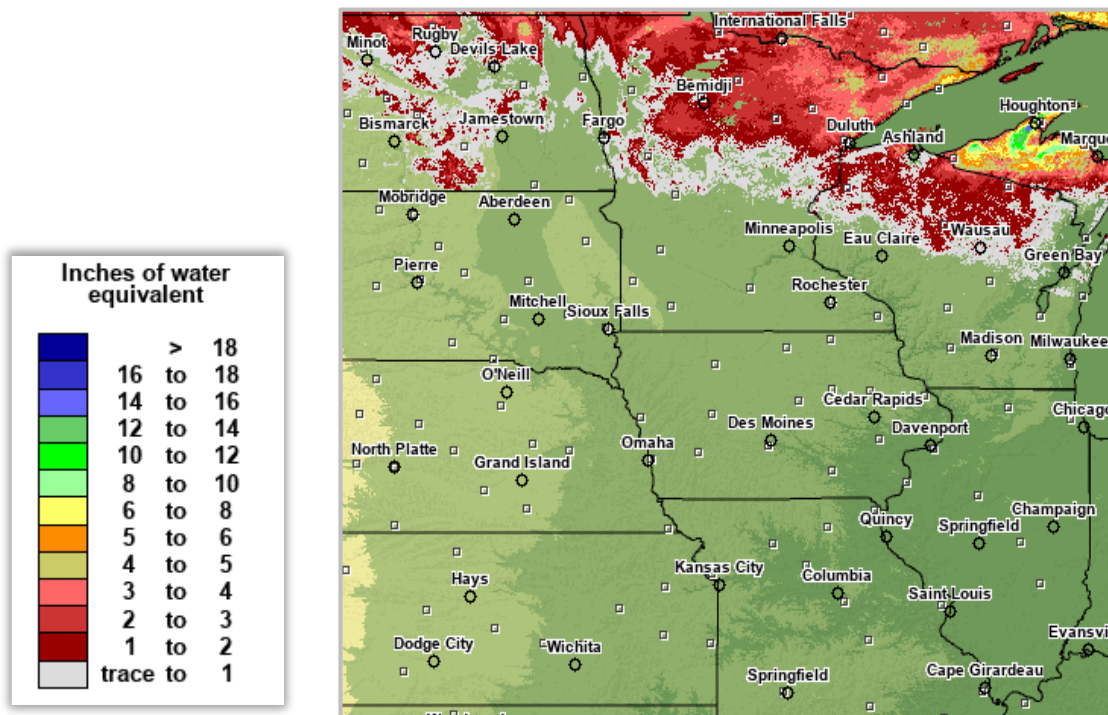
• Lincoln, Illinois



# Snow Water Content

February 26, 2025

## Snow Water Equivalent (SWE)





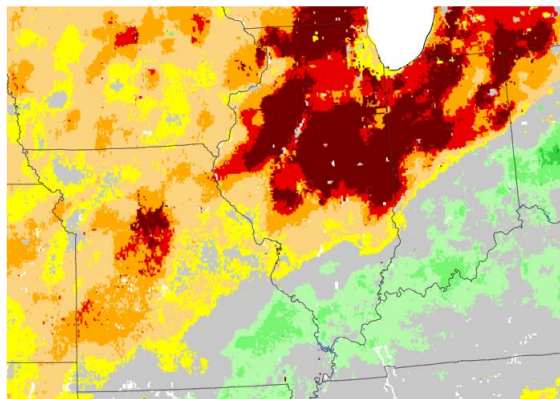


# Soil Conditions

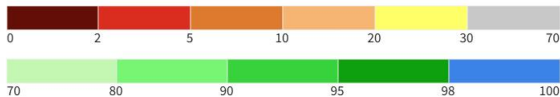
February 27, 2025

## Deep Layer Moisture (down to 39")

0-100 cm Soil Moisture Percentile



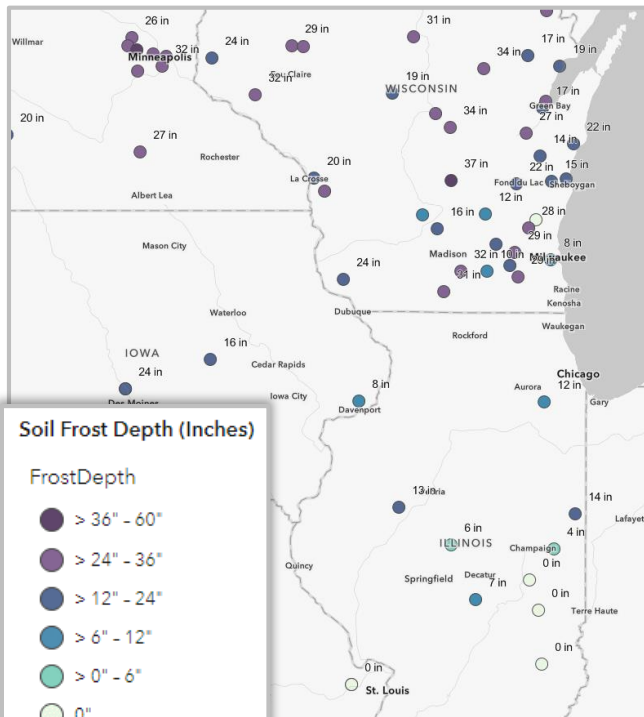
0-100 cm Soil Moisture Percentile



Source(s): NASA  
Data Valid: 02/26/25

Drought.gov

## Frost Depth



Soil Frost Depth (Inches)

FrostDepth

- > 36" - 60"
- > 24" - 36"
- > 12" - 24"
- > 6" - 12"
- > 0" - 6"
- 0"

## Soil Moisture

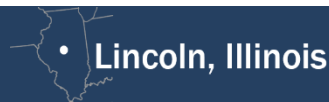
- Deep soil moisture deficits across most of Illinois and Missouri
- Near normal to above normal soil moisture across southeast Missouri into southern Illinois

## Frost Depth

- 6"-12" depths across portions of central Illinois...with increasing surface thaw.
- Areas of zero frost in southern Illinois into southeast Missouri



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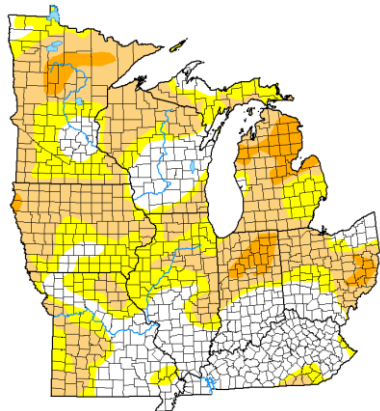




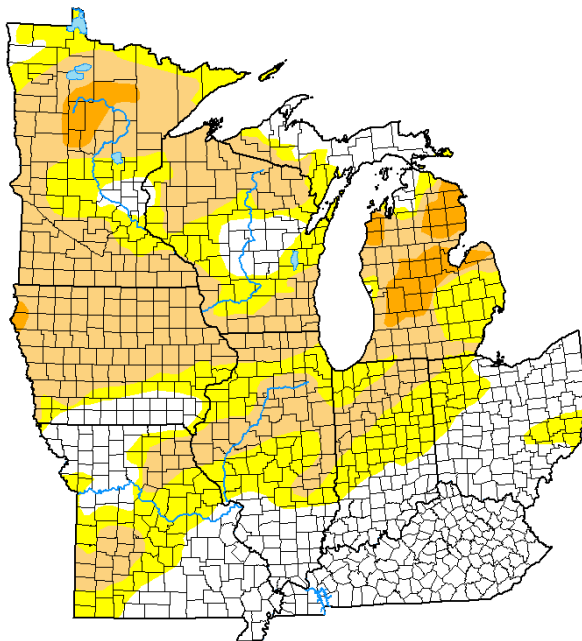


# Drought Monitor

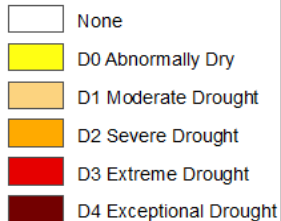
December 5, 2024



February 27, 2025



**Intensity:**



- **Latest Illinois Drought Conditions**
  - D0 (Abnormally Dry): 39%
  - D1 (Moderate Drought): 38%
- **Latest Missouri Drought Conditions**
  - D0 (Abnormally Dry): 33%
  - D1 (Moderate Drought): 16%
- **Drought conditions have changed little overall through the winter season.**

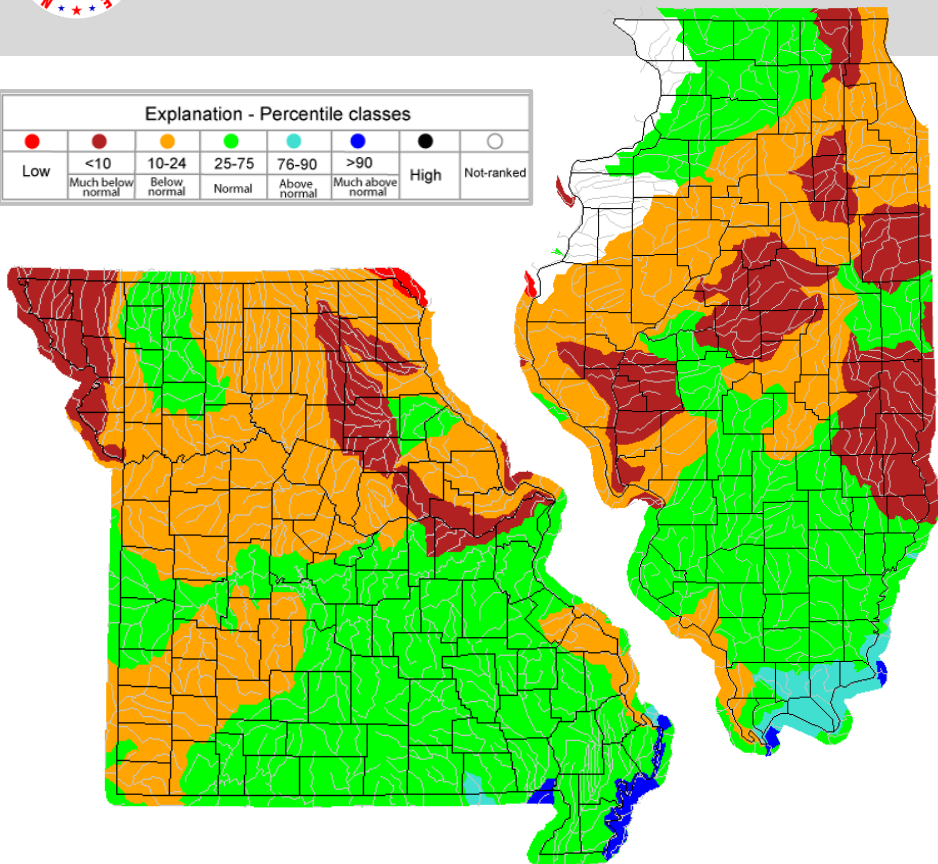




# USGS Streamflows

Explanation - Percentile classes

Low	<10	10-24	25-75	76-90	>90	High	Not-ranked
	Much below normal	Below normal	Normal	Above normal	Much above normal		



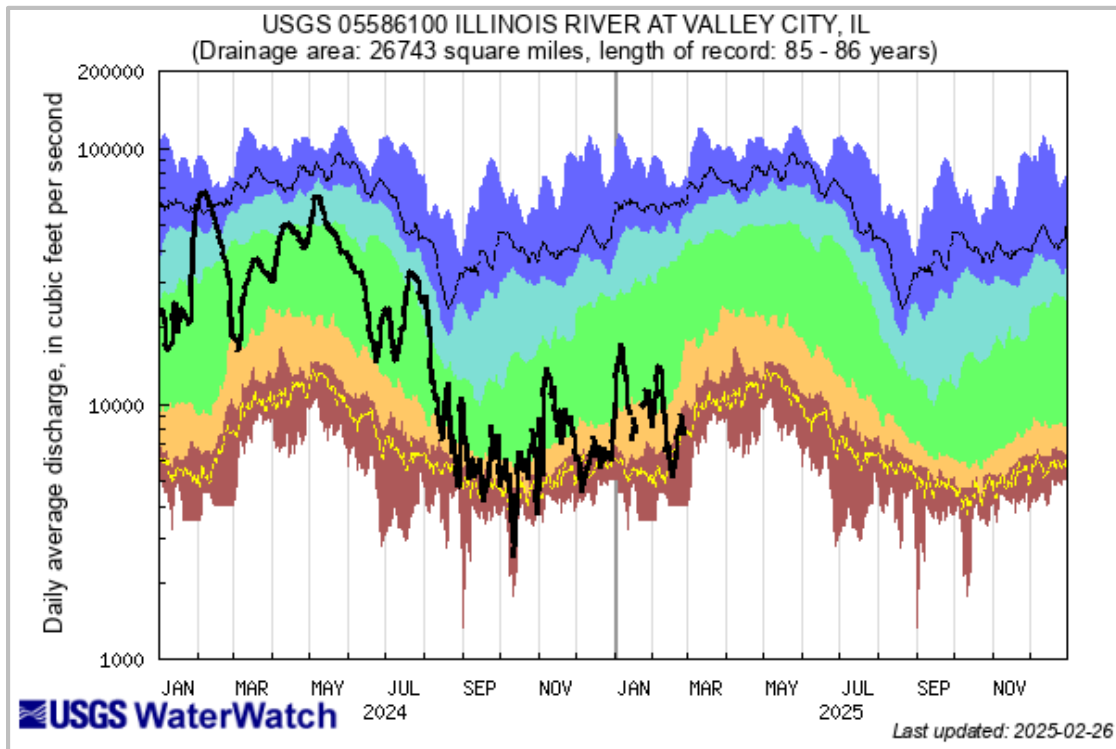
- **Illinois Streamflow Conditions**
  - Near normal across northwest and southern sections of the state
  - Below normal to much below normal across central and northeast sections
- **Missouri Streamflow Conditions**
  - Near normal across southern sections
  - Below normal to much below normal across central and northern sections





# USGS Streamflows

## Illinois River at Valley City, IL



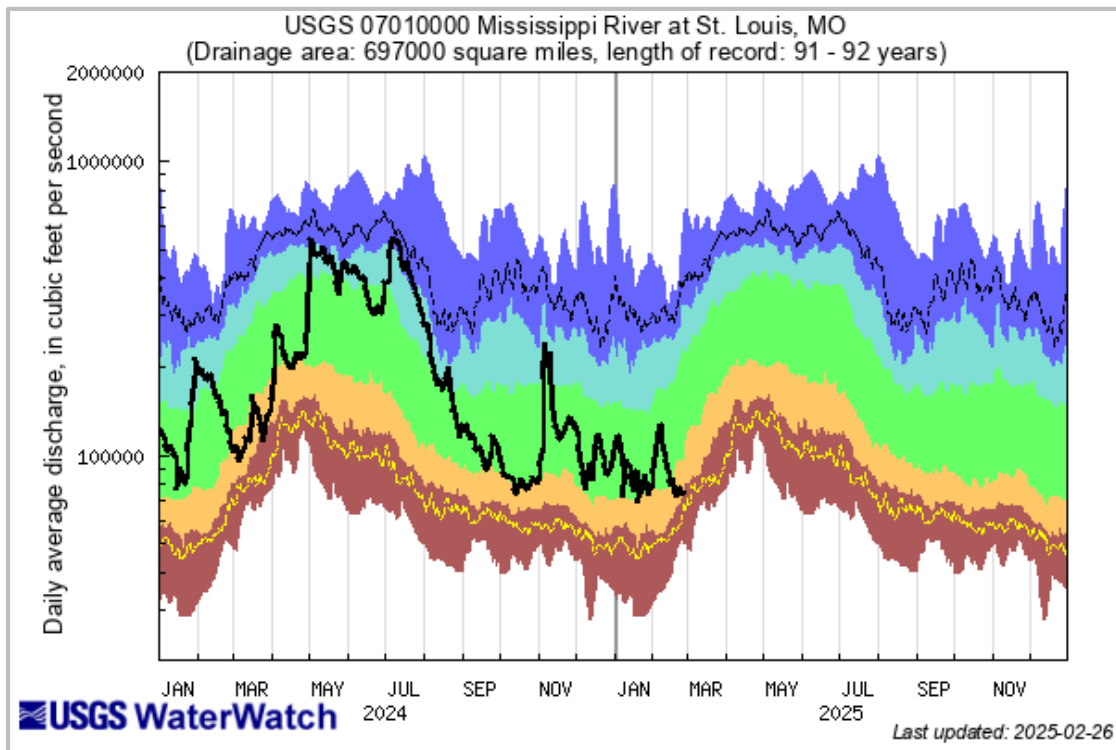
Explanation - Percentile classes						
lowest-10th percentile	5	10-24	25-75	76-90	95	90th percentile - highest
Much below Normal	Below normal	Normal	Above normal	Much above normal		Flow





# USGS Streamflows

## Mississippi River at St. Louis, MO

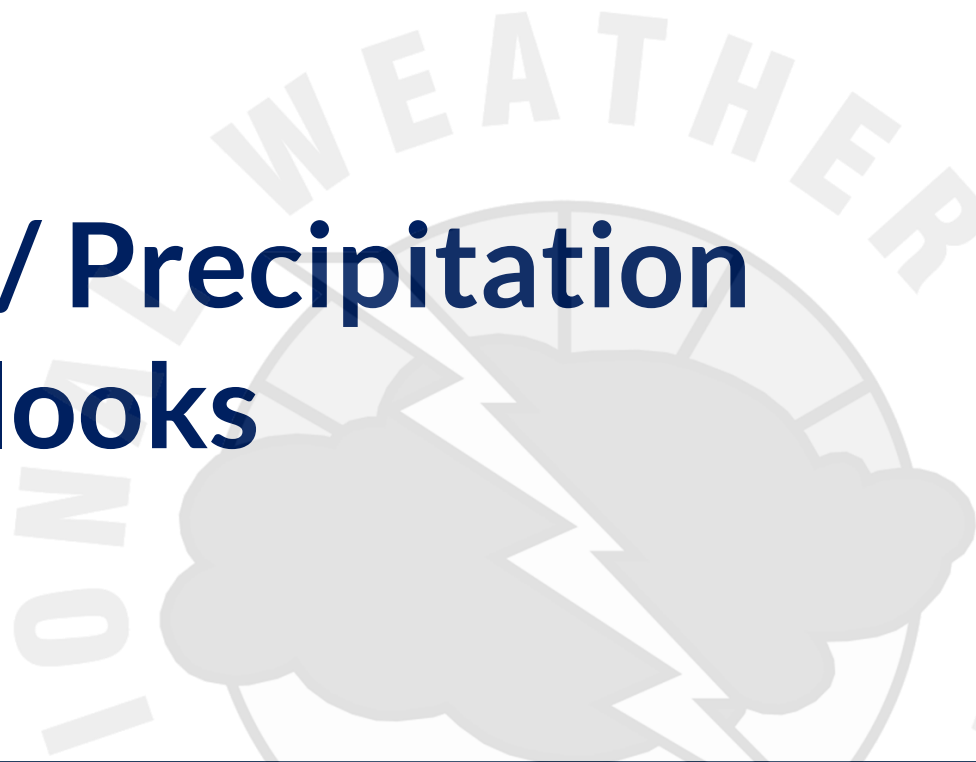


Explanation - Percentile classes						
lowest-10th percentile	5	10-24	25-75	76-90	95	90th percentile-highest
Much below Normal	Below normal	Normal	Above normal	Much above normal		Flow





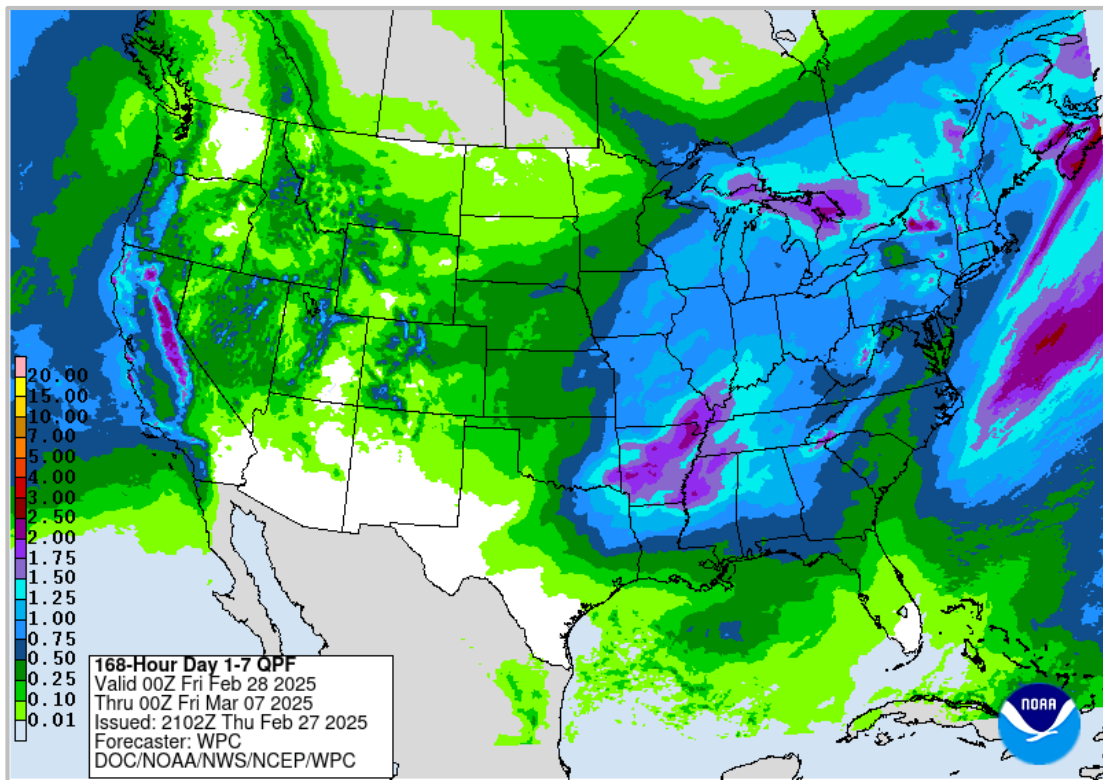
# Temperature / Precipitation Outlooks







# 7-Day Precipitation Forecast



- Forecast precipitation through Thu morning
- Next chance for precipitation early to mid next week





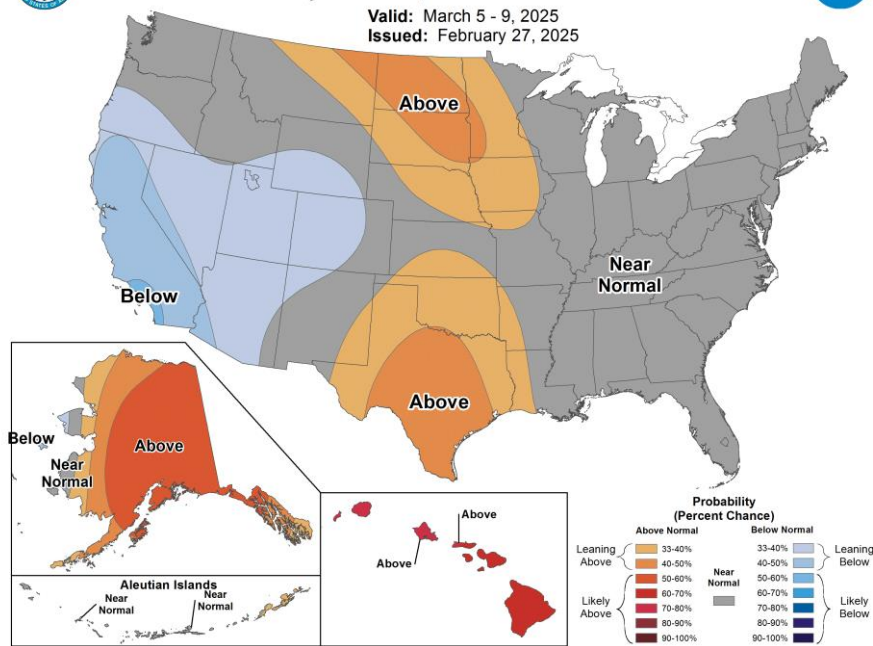
# 6-10 Day Outlook

Valid: Mar 5 - 9



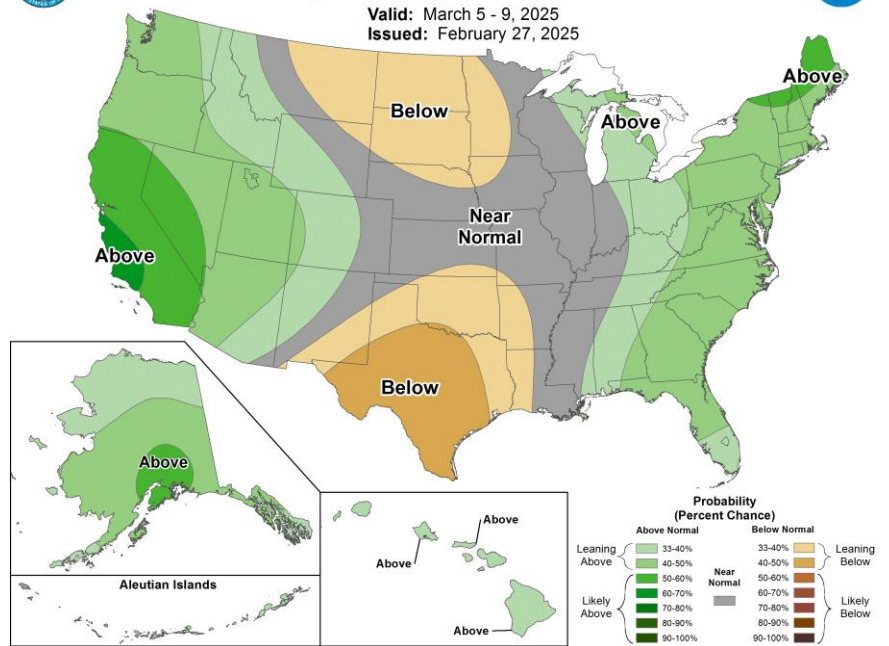
## 6-10 Day Temperature Outlook

Valid: March 5 - 9, 2025  
Issued: February 27, 2025



## 6-10 Day Precipitation Outlook

Valid: March 5 - 9, 2025  
Issued: February 27, 2025





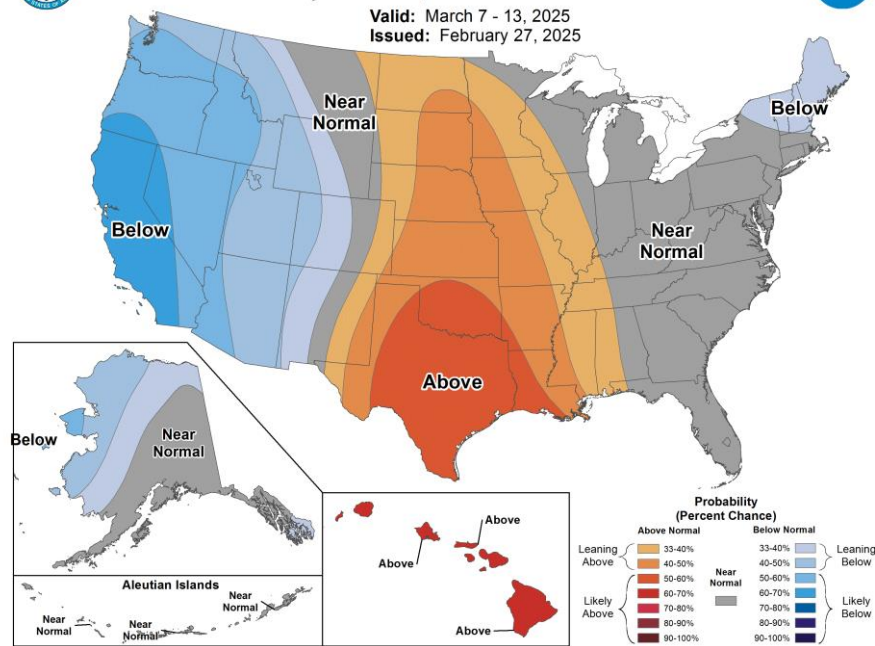
# 8-14 Day Outlook

Valid: Mar 7 - 13



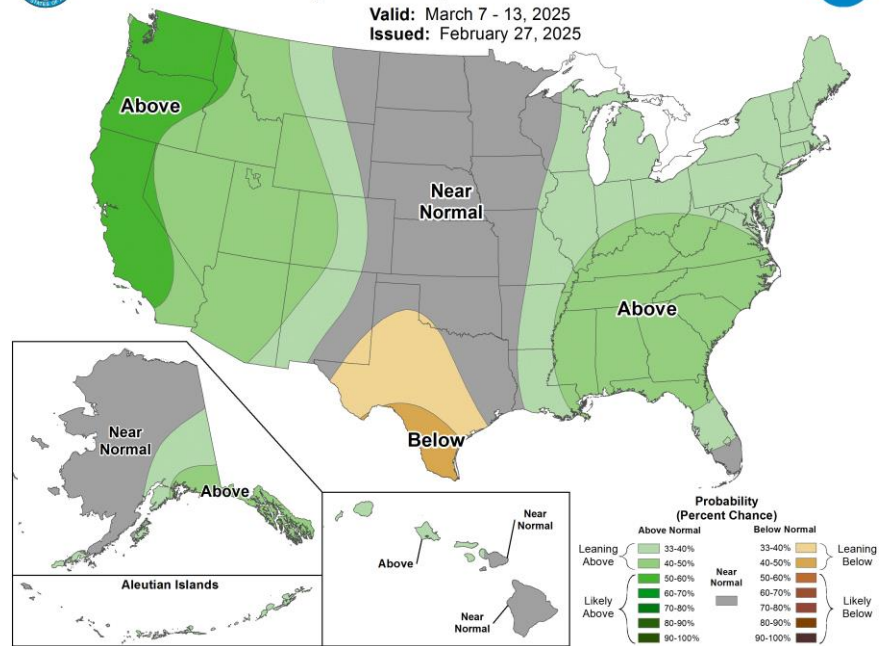
## 8-14 Day Temperature Outlook

Valid: March 7 - 13, 2025  
Issued: February 27, 2025



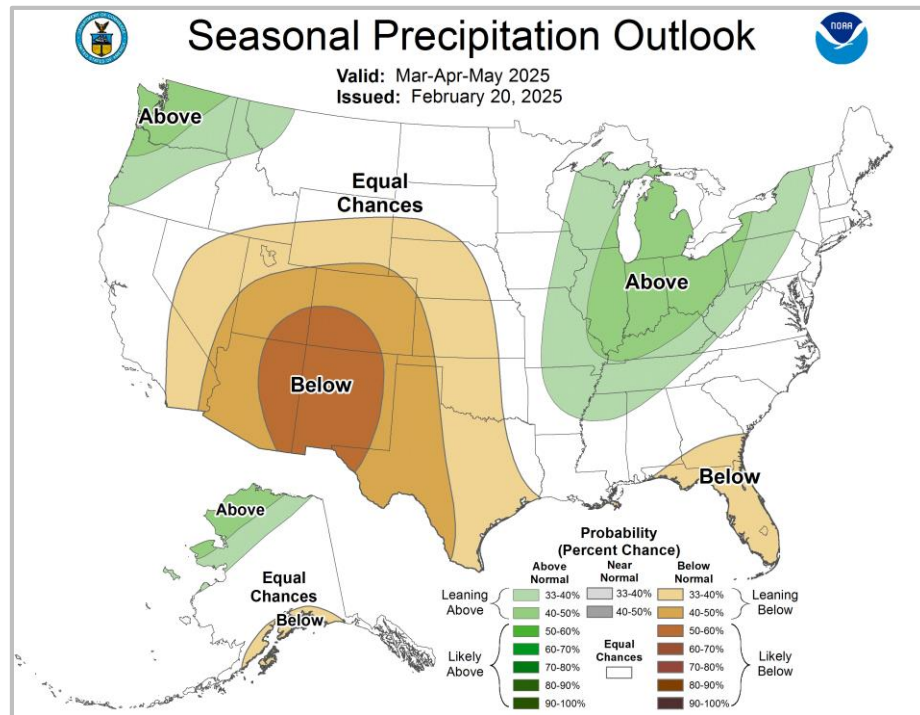
## 8-14 Day Precipitation Outlook

Valid: March 7 - 13, 2025  
Issued: February 27, 2025



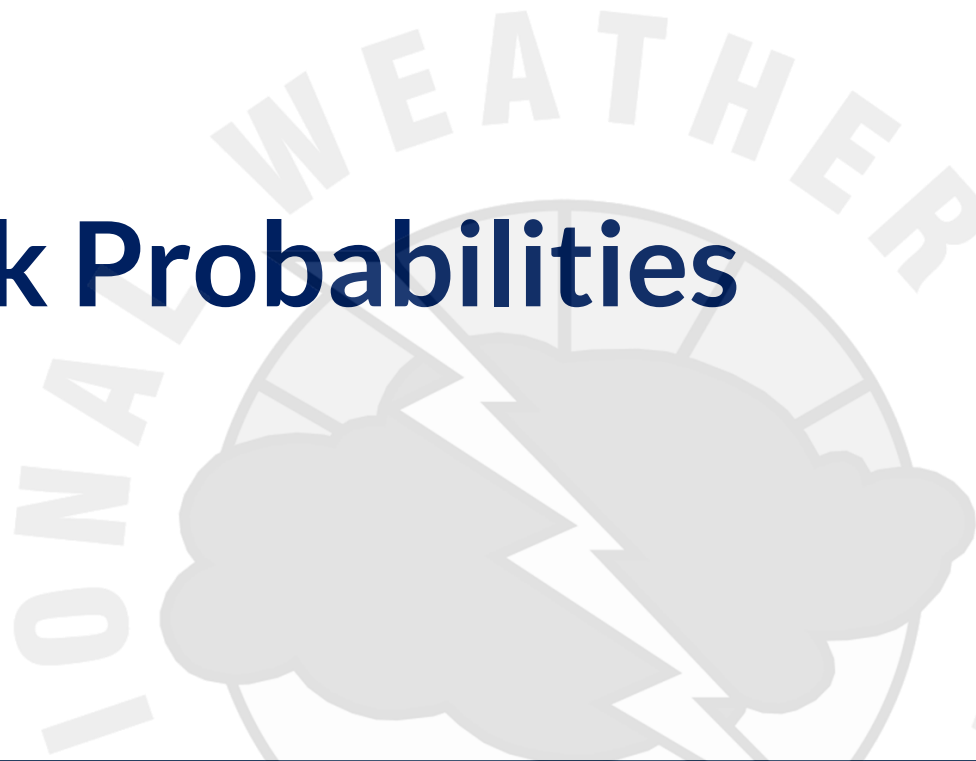


**Valid: Mar / Apr / May**





# Flood Outlook Probabilities





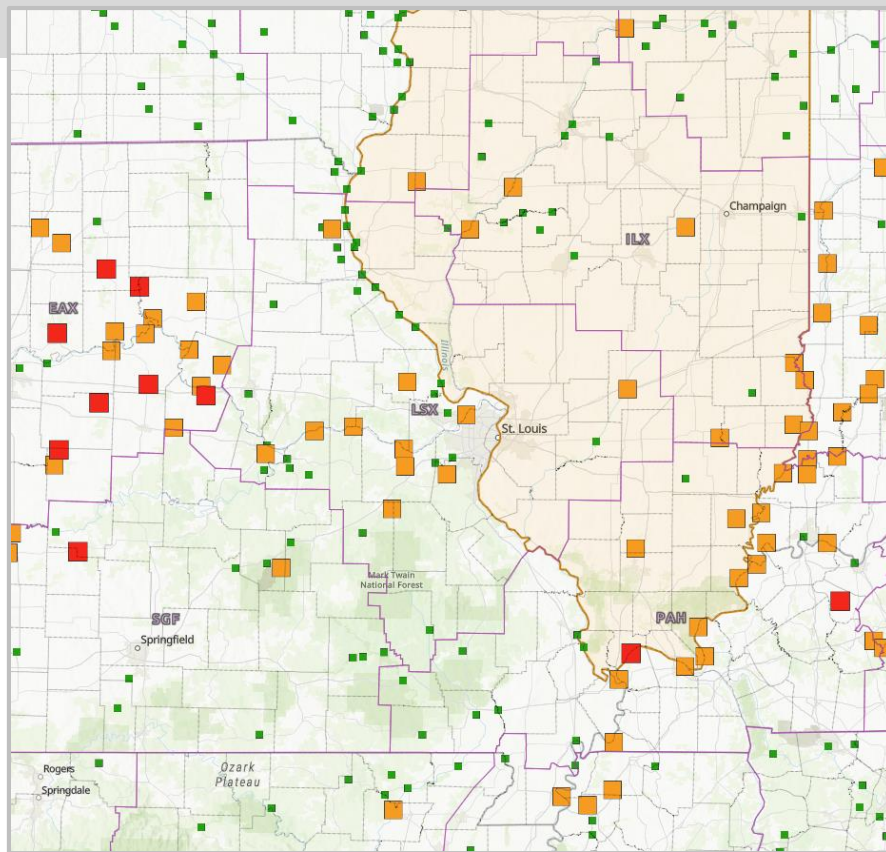


# Spring Flood Outlook

Greater than 50% Likelihood

- Greater than 50% likelihood
- Flood potential will be driven by springtime rains

> 50% Major Flooding
> 50% Moderate Flooding
> 50% Minor Flooding
< 50% Chance of Flooding



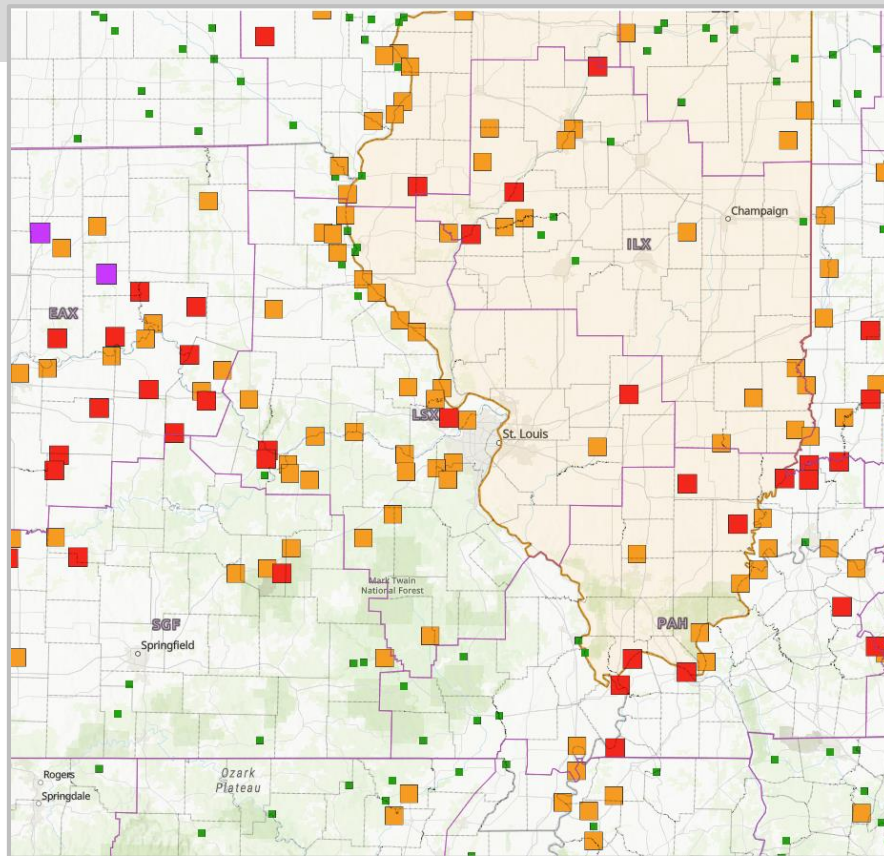


# Spring Flood Outlook

Greater than 25% Likelihood

- Greater than 25% likelihood

> 25% Major Flooding
> 25% Moderate Flooding
> 25% Minor Flooding
< 25% Chance of Flooding





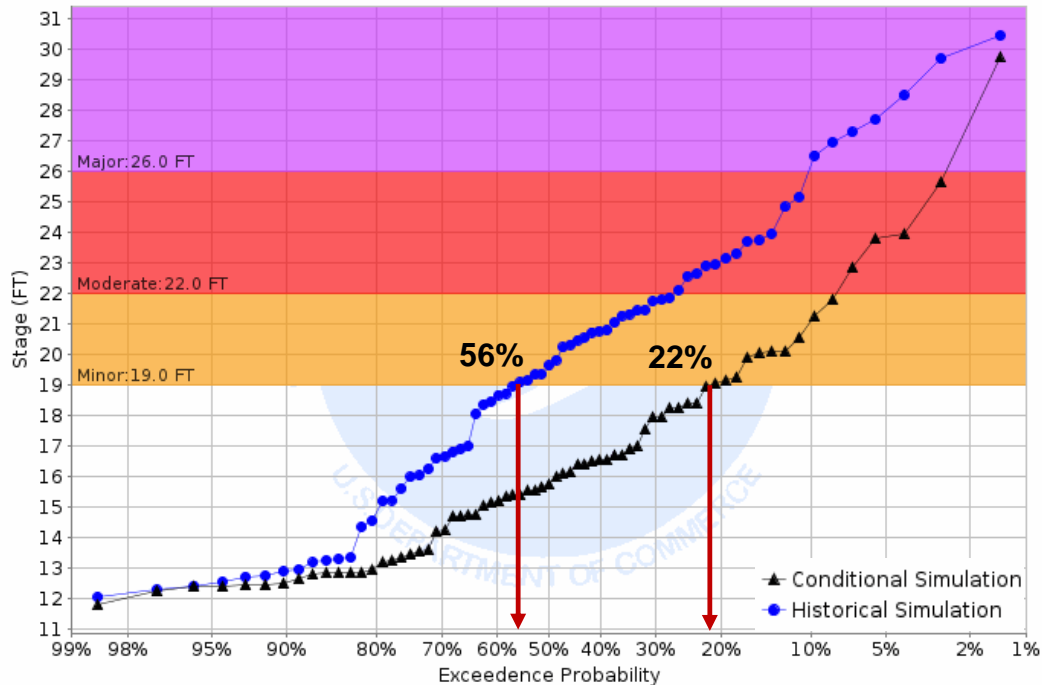
# Spring Flood Outlook

## Mississippi River at Quincy, IL

Chance of Exceeding River Stage at Mississippi River at Quincy - Memorial Brdg (UINI2)

Forecast for the period 03/03/2025 - 06/01/2025

This is a conditional simulation based on the conditions as of 02/24/2025



### Conditional Simulation

- Chances of the river exceeding the given levels based on the current conditions and latest probabilistic river forecast.

### Historical Simulation

- Chances of the river exceeding the given levels historically (or on average).





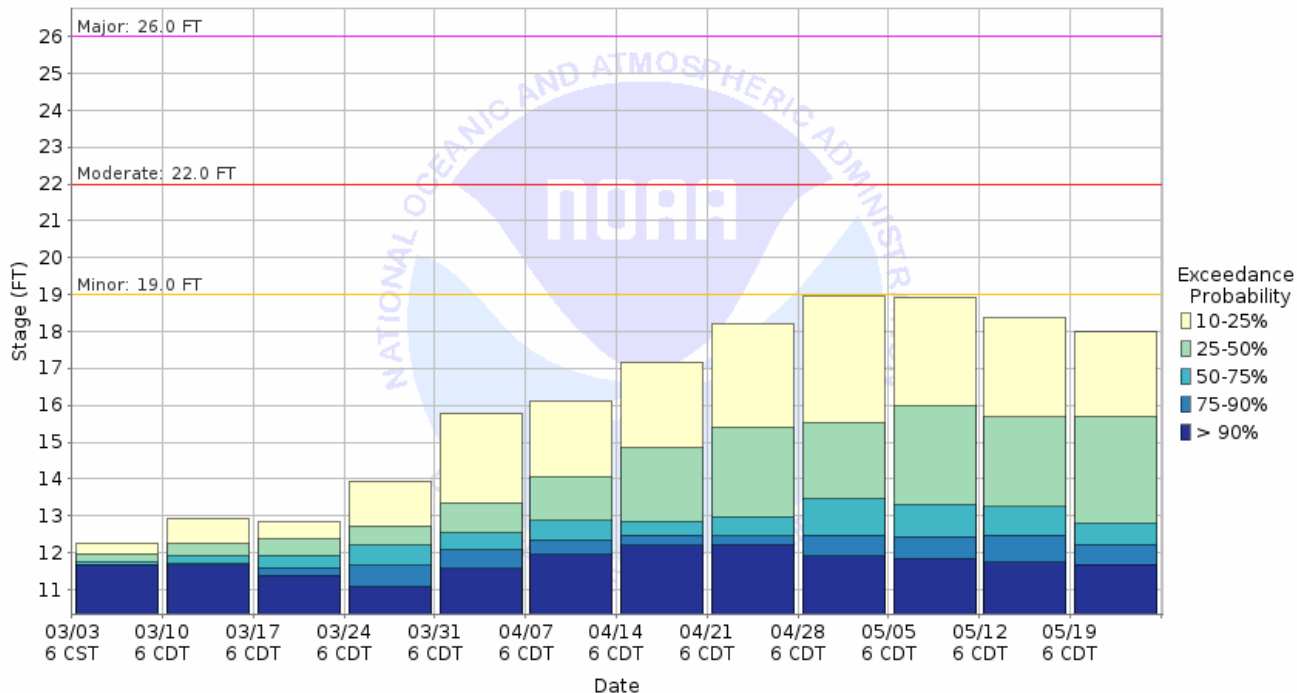
# Spring Flood Outlook

## Mississippi River at Quincy, IL

Weekly Chance of Exceeding River Stage at Mississippi River at Quincy - Memorial Brdg (UINI2)

Forecast for the period 03/03/2025 - 06/01/2025

This is a conditional simulation based on the conditions as of 02/24/2025





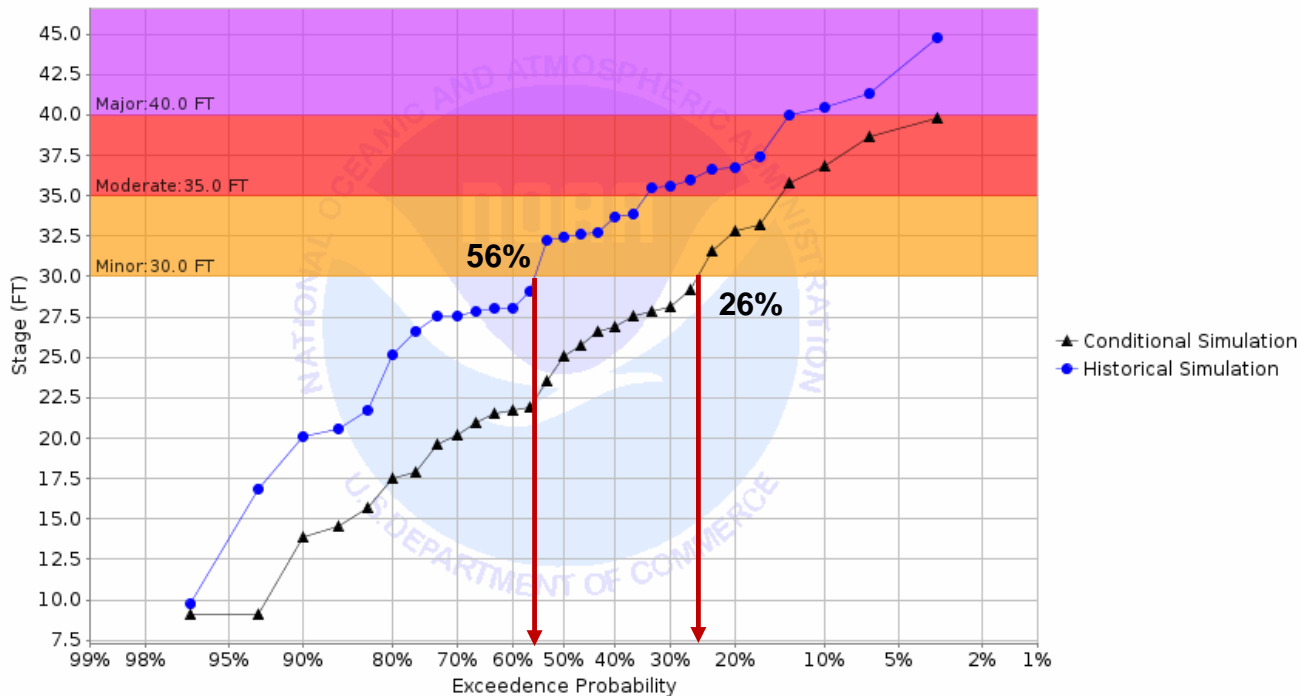
# Spring Flood Outlook

## Mississippi River at St. Louis, MO

Chance of Exceeding River Stage at Mississippi River at St Louis (Eads Bridge) (EADM7)

Forecast for the period 03/03/2025 - 06/01/2025

This is a conditional simulation based on the conditions as of 02/24/2025







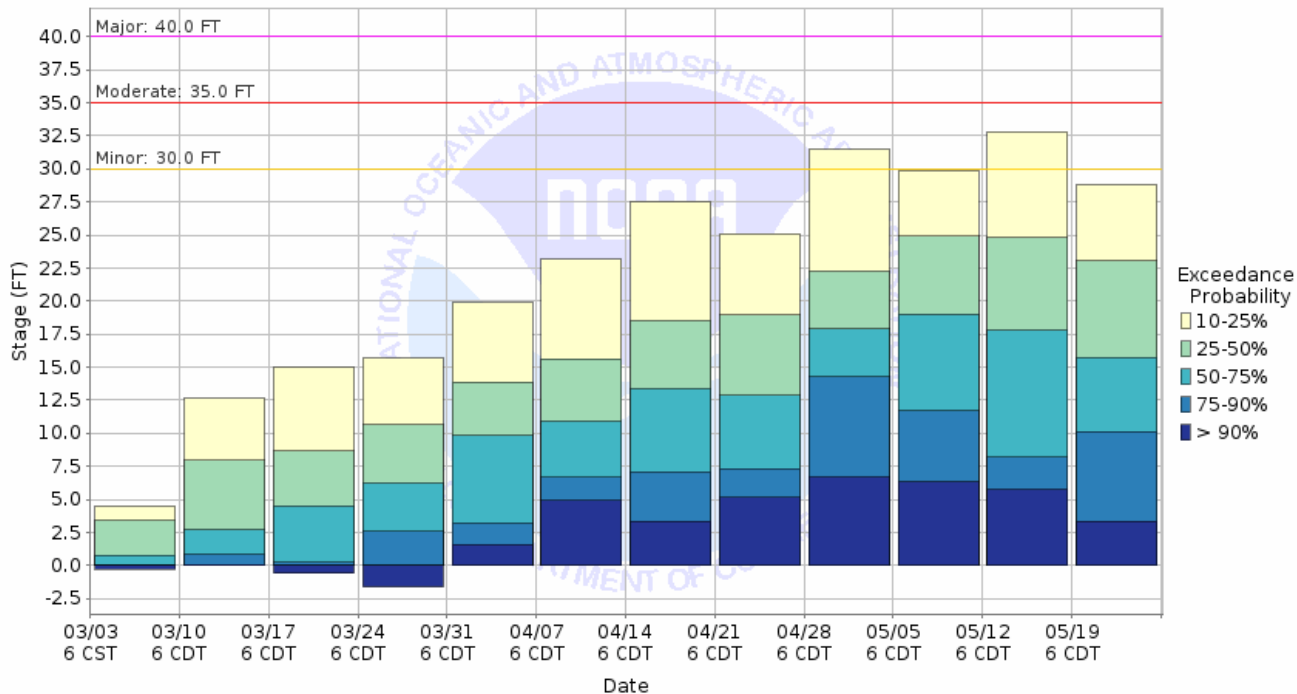
# Spring Flood Outlook

## Mississippi River at St. Louis, MO

Weekly Chance of Exceeding River Stage at Mississippi River at St Louis (Eads Bridge) (EADM7)

Forecast for the period 03/03/2025 - 06/01/2025

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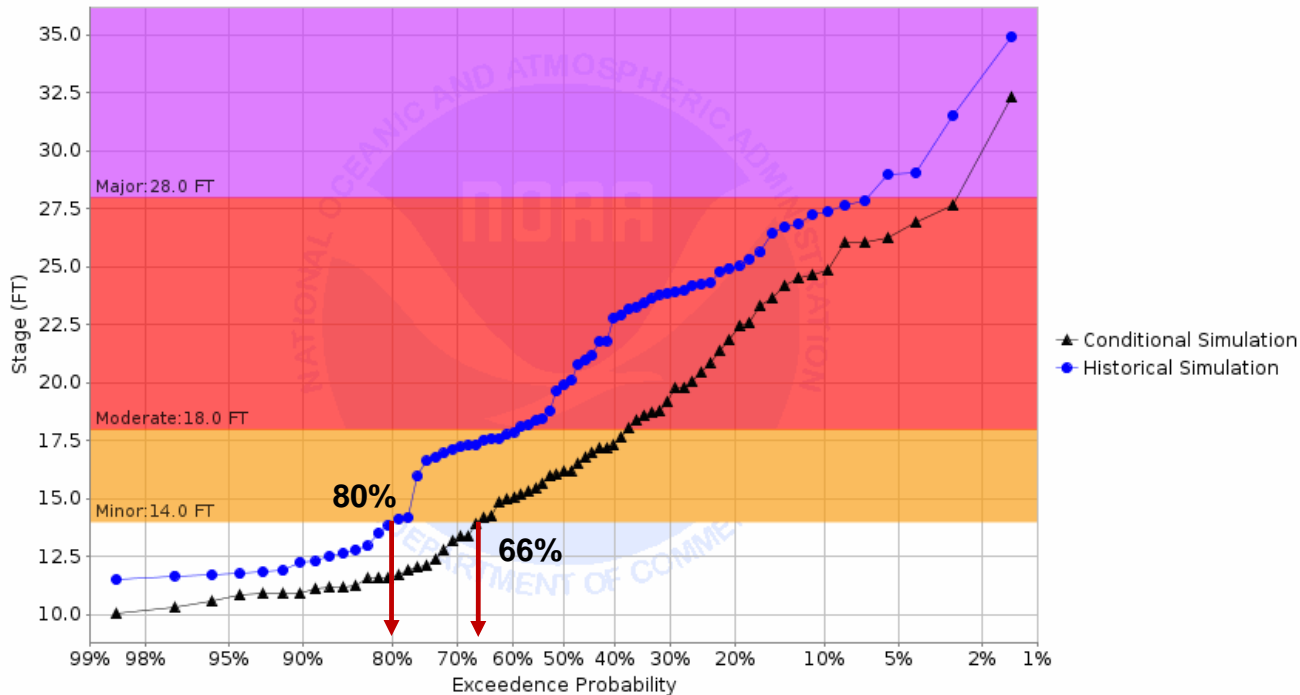




# Spring Flood Outlook

## Illinois River at Beardstown, IL

Chance of Exceeding River Stage at Illinois River at Beardstown (BEA12)  
Forecast for the period 03/03/2025 - 06/01/2025  
This is a conditional simulation based on the conditions as of 02/24/2025





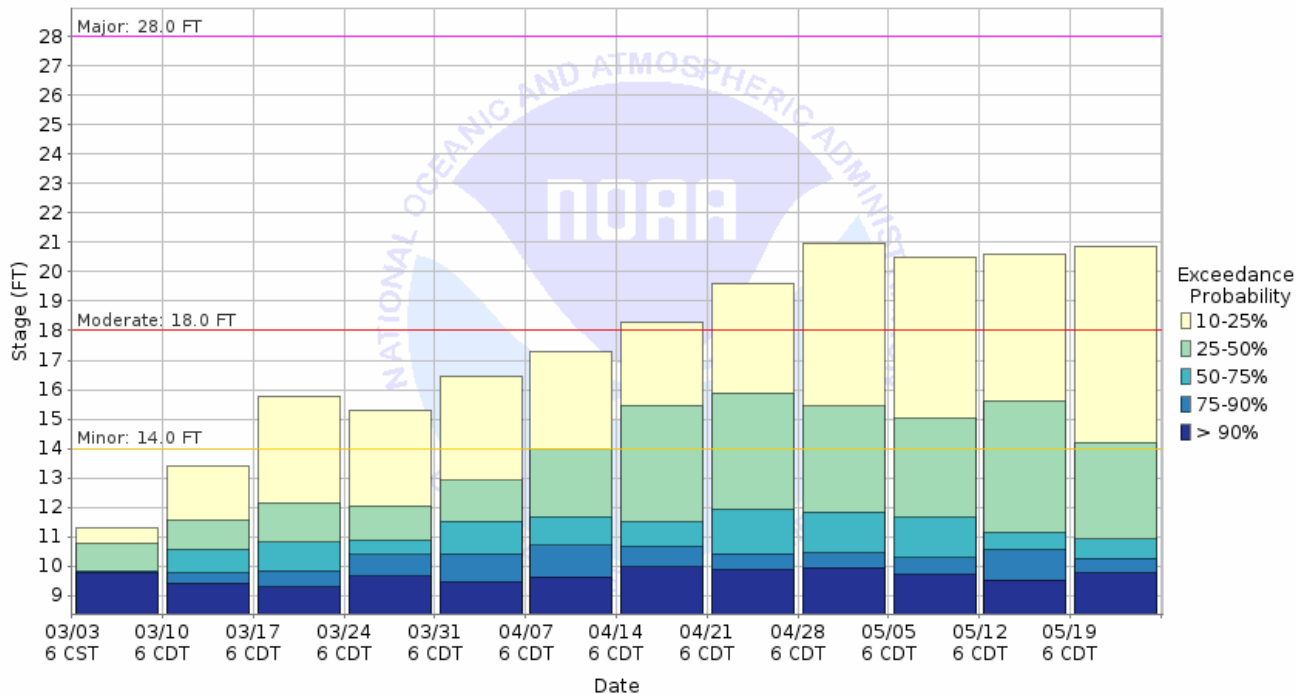
# Spring Flood Outlook

## Illinois River at Beardstown, IL

Weekly Chance of Exceeding River Stage at Illinois River at Beardstown (BEA12)

Forecast for the period 03/03/2025 - 06/01/2025

This is a conditional simulation based on the conditions as of 02/24/2025





# National Water Prediction Service (NWPS)

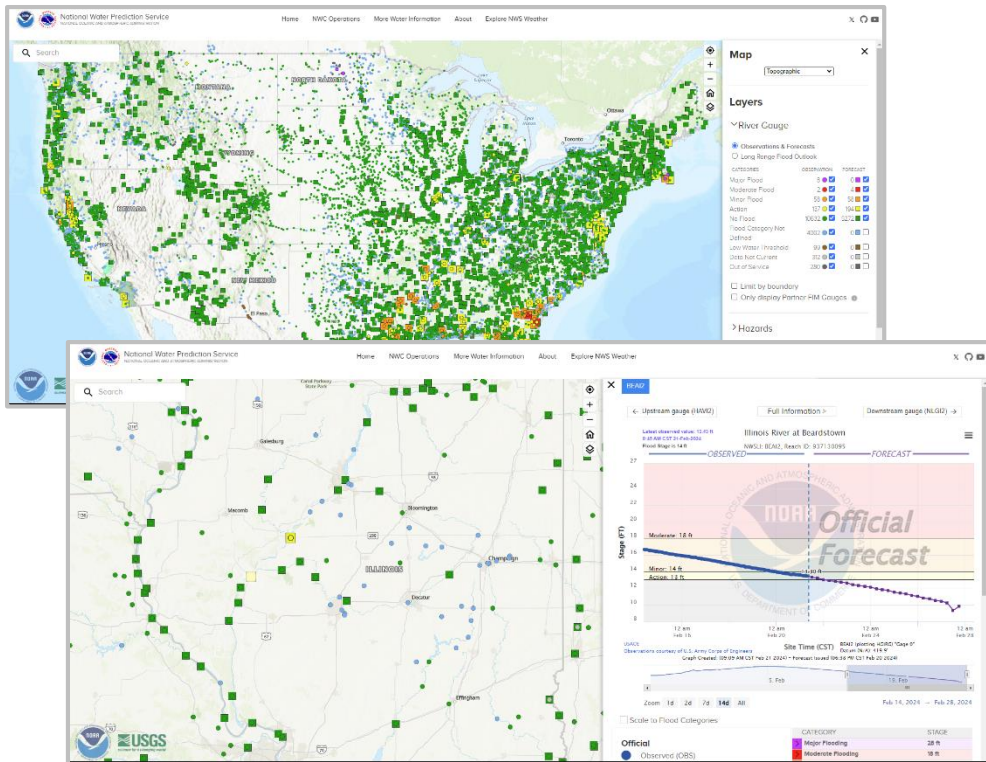
## National Water Prediction Service

- **Website**

- <https://water.noaa.gov>

- **User's Guide**

- [https://www.weather.gov/media/owp/operations/nwps\\_user\\_guide.pdf](https://www.weather.gov/media/owp/operations/nwps_user_guide.pdf)





# Hydrologic Ensemble Forecast Service (HEFS)

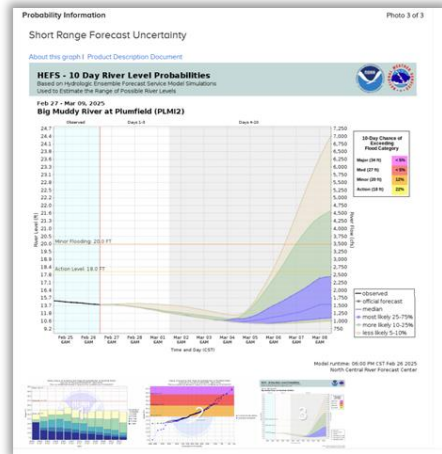
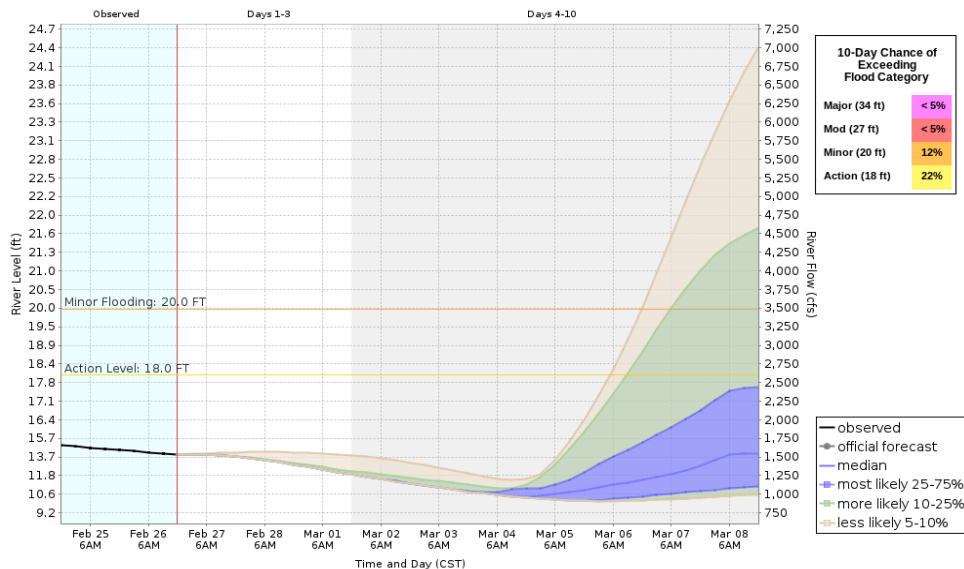
Provides short-range river forecast uncertainty



## HEFS - 10 Day River Level Probabilities

Based on Hydrologic Ensemble Forecast Service Model Simulations  
Used to Estimate the Range of Possible River Levels

Feb 27 - Mar 09, 2025  
**Big Muddy River at Plumfield (PLM12)**



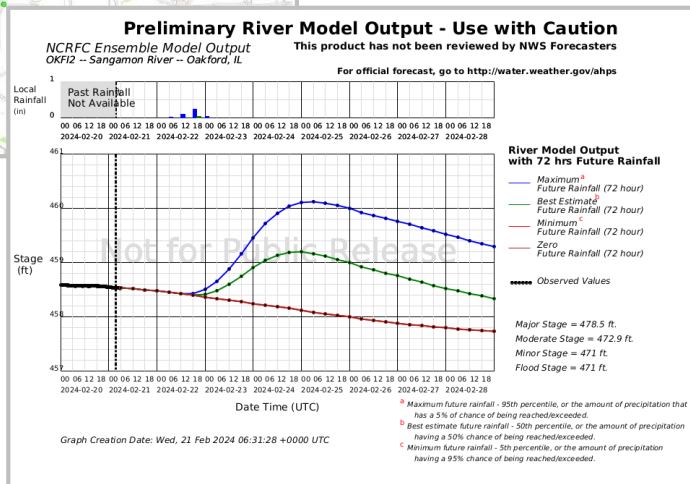
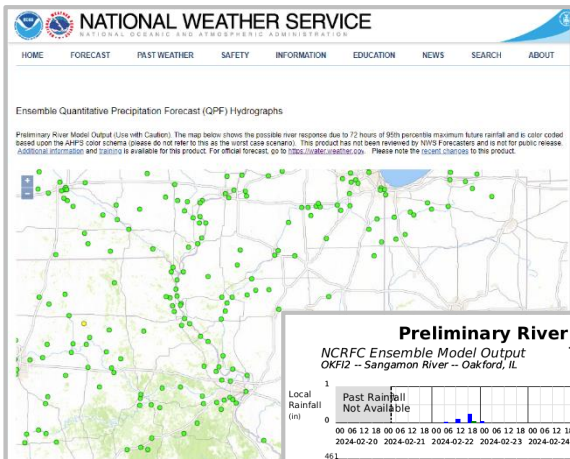
Lincoln, Illinois





# Additional Ensemble Forecasts

How confident should we be in this forecast?



Raw river model output: 24/48/72 hours of forecast rainfall

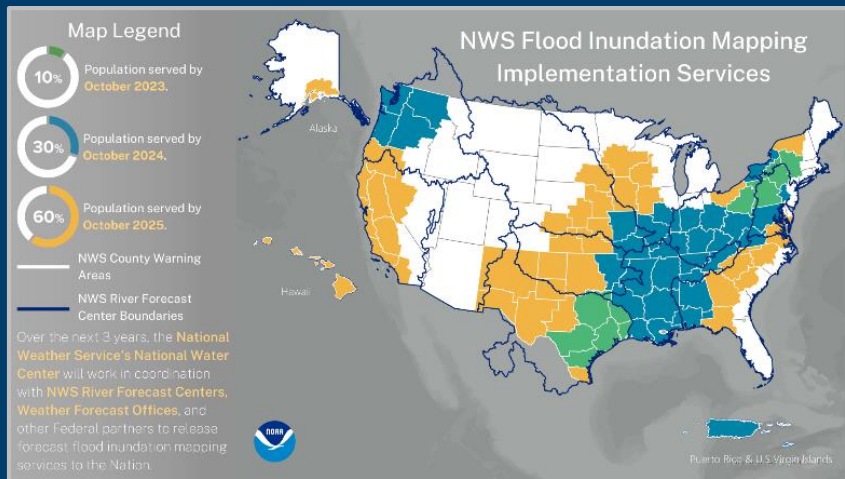
- Zero Precipitation
- Minimum Precip. (95% chance of reaching/exceeding)
- Best Estimate Precip. (50% chance of reaching/exceeding)
- Maximum Precip. (5% chance of reaching/exceeding)





# National Water Prediction Service

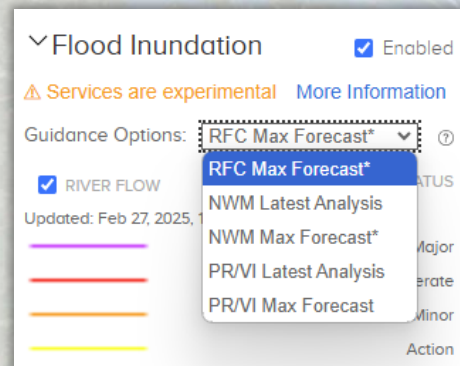
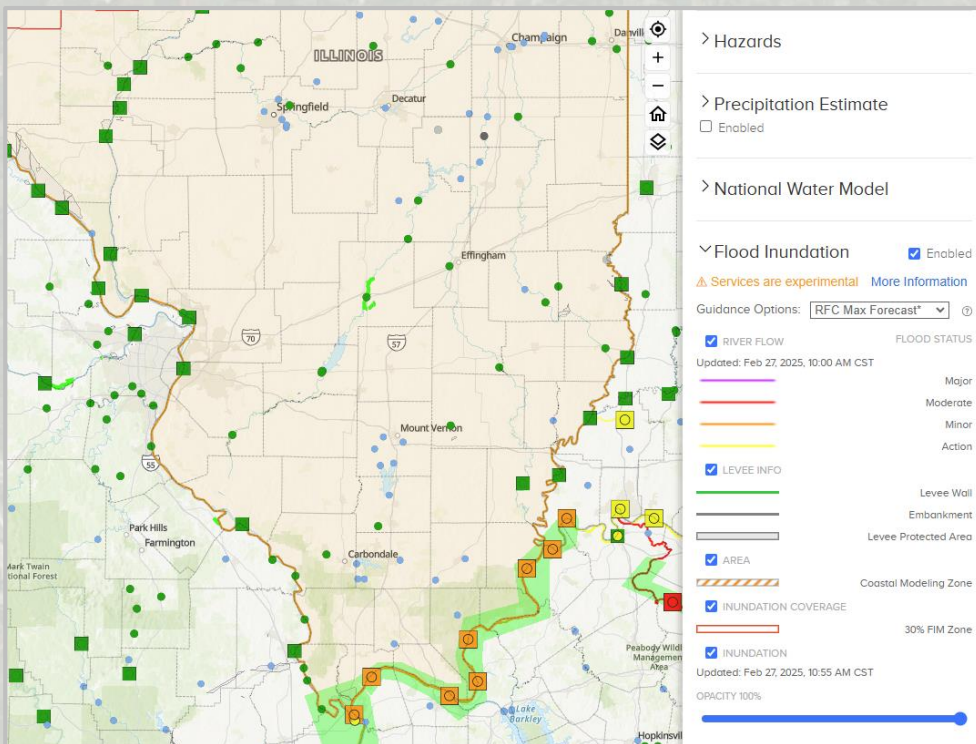
- **Flood Inundation Mapping** is now available on NWPS as an experimental service





# National Water Prediction Service (NWPS)

- Flood Inundation Mapping now available (Experimental)
- Contact your local Service Hydrologist for additional information





# Questions?

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**Mary Lamm - NWS Paducah, KY**

mary.lamm@noaa.gov

270-744-6440

